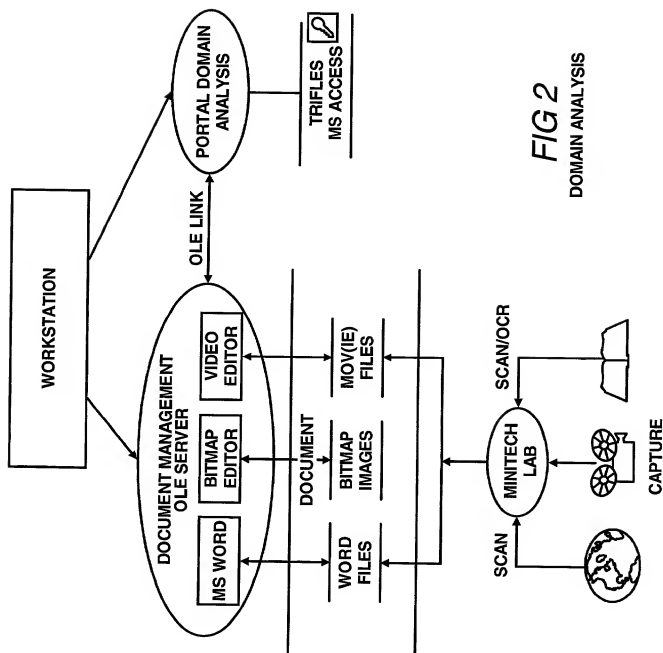
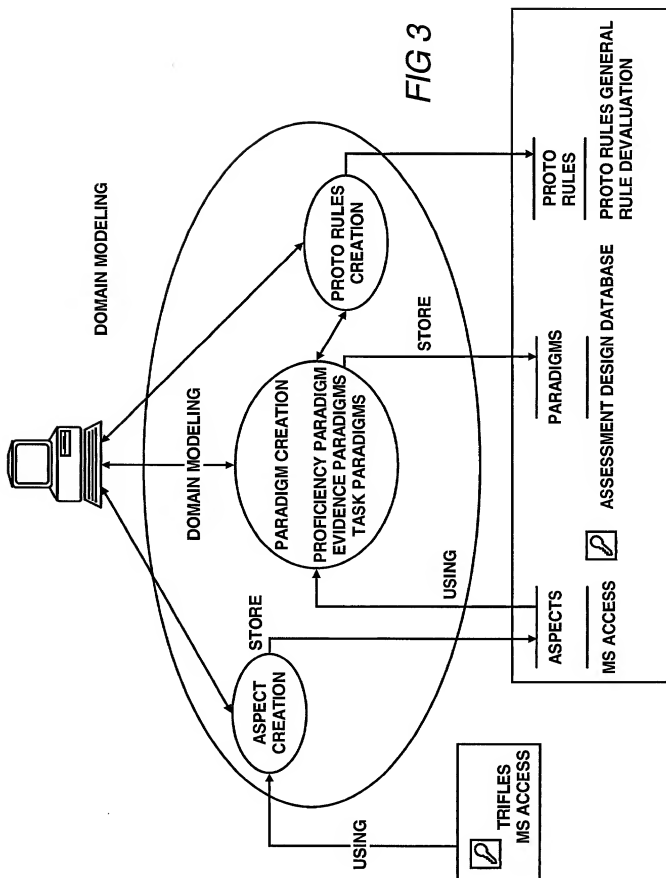


FIG 1



**FIG 2**  
 DOMAIN ANALYSIS



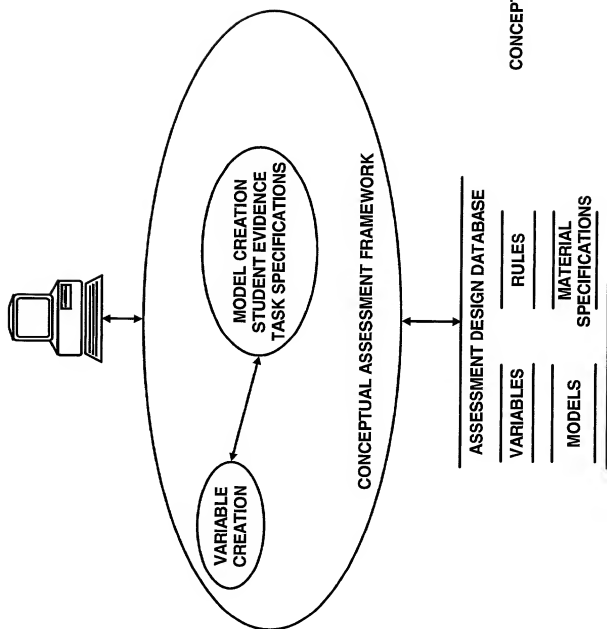
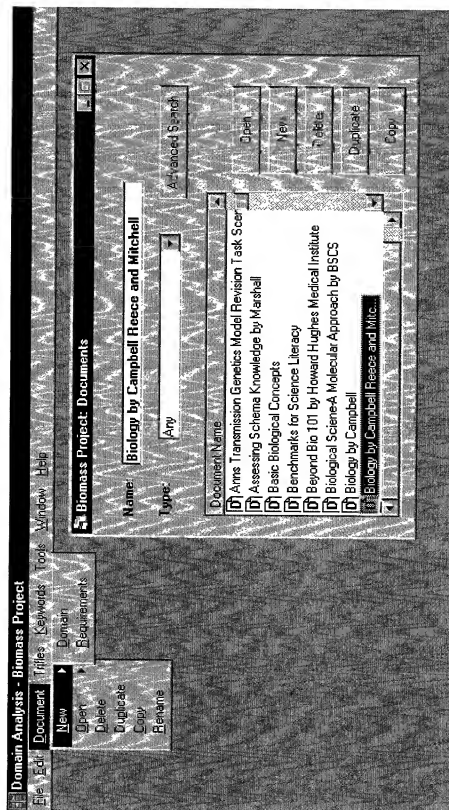


FIG 4

CONCEPTUAL ASSESSMENT FRAMEWORK

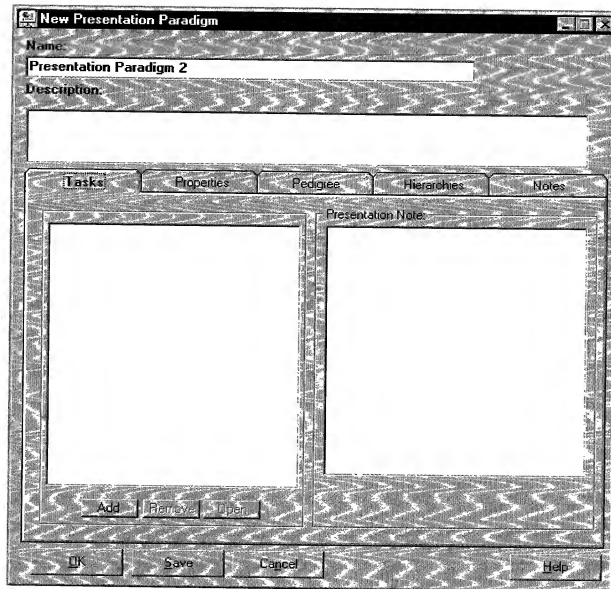


DOCUMENT MANAGEMENT FORM

FIG 5



**FIG 6**



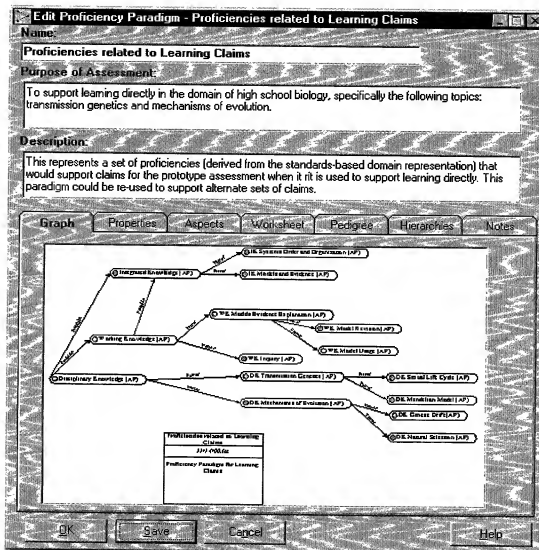
PRESENTATION PARADIGM

*FIG 7*

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# PROFICIENCY PARADIGM

FIG 9A

**Edit Proficiency Paradigm**

Name: \_\_\_\_\_

**Proficiencies related to Learning Claims**

**Purpose of Assessment:**  
 To support learning directly in the domain of high school biology, specifically the following topics:  
 transmission genetics and mechanisms of evolution.

**Description:**  
 This represents a set of proficiencies (derived from the standards-based domain representation) that  
 would support claims for the prototype assessment when it is used to support learning directly. This  
 paradigm could be re-used to support alternate sets of claims.

Graph Properties Aspects **Scope** Pedigree Hierarchies Notes

**Evidence Paradigms**

- ☒ Agouti Segment 1 - Formalize Ho [Evid. ...]
- ☒ Agouti Segment 10 - Cross Expertise [Evid. ...]
- ☒ Agouti Segment 11 - Punnett Sq [Evid. ...]
- ☒ Agouti Segment 12 - Chi Sq [Evidence]
- ☒ Agouti Segment 13 - Ho Confirm/Disco
- ☒ Agouti Segment 14 - Ho Confirm/Disco
- ☒ Agouti Segment 15 - Ho Confirm/Disco
- ☒ Agouti Segment 16 - Write Report [Evi. ...]
- ☒ Agouti Segment 17 - Sexual Life Cycle
- ☒ Agouti Segment 2 - Verify Method [Evi. ...]
- ☒ Agouti Segment 3 - Phenotypic Proport.
- ☒ Agouti Segment 4 - Imposse [Evidence]

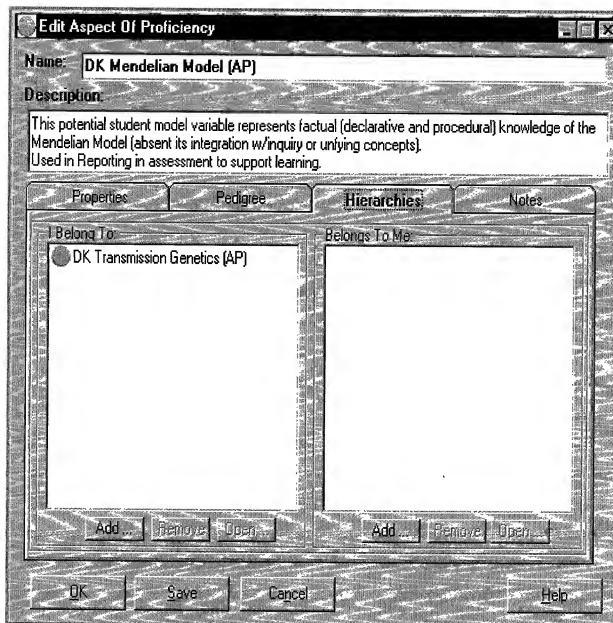
Work sheets

Add Remove Done

OK Save Cancel Help

PROFICIENCY PARADIGM

FIG 9B



AN EXAMPLE OF AN ASPECT OF PROFICIENCY

*FIG 9C*

**Edit Description Of Performance Outcomes And Behavior**

**Name:** Data Organization - Scoring Obs

**Description:**  
This describes possible outcomes for organizing data so that it can be interpreted.

**Possible Values:**  
Add

Effective data organization  
 Somewhat effective data organization  
 Ineffective data organization

**Keywords:**  
Add Remove

**Rules:**  
☒ Observable  
☐ Consolidation

**Buttons:** OK Save Cancel Help

---

**Edit Description Of Performance Outcomes And Behavior**

**Name:** Data/Model Relationships - Scoring Obs

**Description:**  
This describes possible outcomes in relating patterns of data to particular models.

**Possible Values:**  
Add

Data and model(s) related appropriately  
 Data and model(s) related somewhat appropriately  
 Data and model(s) not related

**Keywords:**  
Add Remove

**Rules:**  
☒ Observable  
☐ Consolidation

**Buttons:** OK Save Cancel Help

EXAMPLES OF DESCRIPTORS OF PERFORMANCE OUTCOMES / BEHAVIORS

FIG 10

**Edit Proto Rule**

Name: **Agouti Segment 1 Interpretation Rule**

**AP/Claim**

☒ DK Mendelian Model (AP)

Add Remove Open

**Relationship:**

Parents DKM and CONTEXT are modeled as compensatory over each of the 4 instances of MMRep and 3 instances of MMGen.

**Difficulty:**

All observables are expected to be of typical difficulty, except the first Mendelian Model Representation one—it is expected to be easier than typical.

☐ Parsing  
☐ Evaluation  
☒ Interpretation

**DPS**

Add Remove Open

**DPD**

▼ Mendelian Model Gener...  
 ▼ Mendelian Model Repre...

Add Remove Open

**Related Proto Rules**

☐ Parsing  
☐ Evaluation  
☐ Interpretation

Add Remove Open

OK  
 Apply  
 Cancel

AN EXAMPLE INTERPRETATION PROTO RULE

FIG 11



**FIG 12**

**Edit Task Skeleton**

Name: **Agouti Segment 1 - Formalize Ho (Task)TS1**

Paradigm Name: **Agouti Segment 1 - Formalize Ho (Task)**

Description:  
This paradigm describes task segment 1 of the agouti mouse scenario. This segment is focused on knowledge related to the Mendelian Model and its representation, as well as investigative technique.

**Stimulus** **Response** **Scope** **Properties** **Pedigree** **Notes**

**KR**

Add  
Mendel's  
Legend

MCI Standard Text Form  
MCI Symbol Tool Box  
Population Attribute Table  
Population Summary Cr...  
Text Prompt(s)

**Stimulus Notes**

The primary stimulus material for this task is the Population Summary Cross Table. In this version it contains Jose's original crosses and results.

Prompts are used for Disciplinary and Investigative Knowledge.

**DPS**

Show Category: **All**

Domain Topic Requirement \* Transmission genetics  
Knowledge Level \* Working  
Number of Genes Determining Characteristic of Interest \* one  
Organism \* real mammal  
Prototype Domain \* biology  
Transmission Genetics \* mode of inheritance

**Roles of Selected DPS:**

OK Save Cancel Help

FIG 13

**New Student Model Variable**

Variable Name: **Student Model Variable 71**

Description:

**States** | **Properties** | **Pedigree** | **Notes**

State Details

State Name:

State Description:

Add

Remove

Sort

↑ ↓

☐ Is a State

☐ Ordered States

OK Save Cancel Help

STUDENT MODEL VARIABLE

FIG 14



**New Evidence Model Variable**

Variable Name: **Evidence Model Variable 185**

Description:

**States**   **Properties**   **Pedigree**   **Notes**

State Details

State Name:

State Description:

☐ True State

☐ Ordered States

↑   ↓

Add  
Remove  
Sort

OK   Save   Cancel   Help

EVIDENCE MODEL VARIABLE

FIG 15

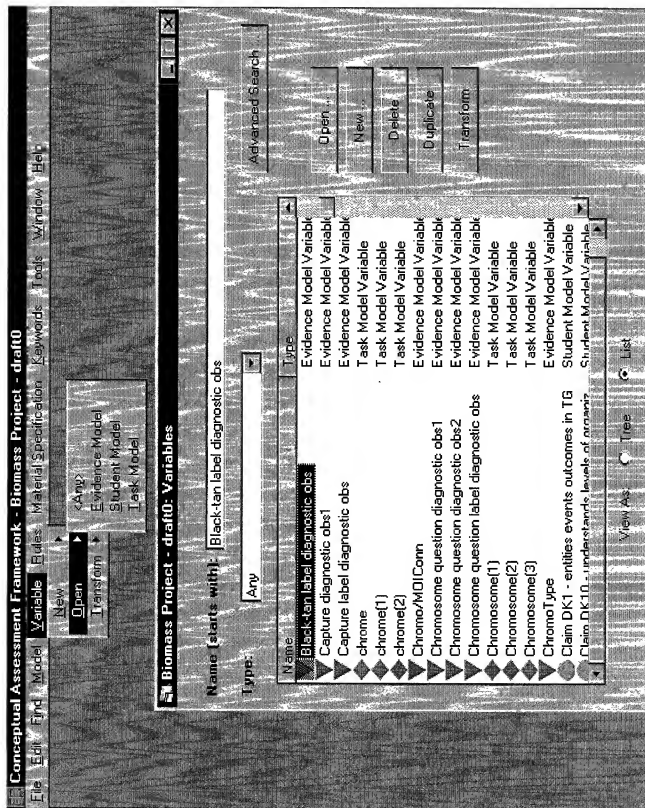


FIG 16

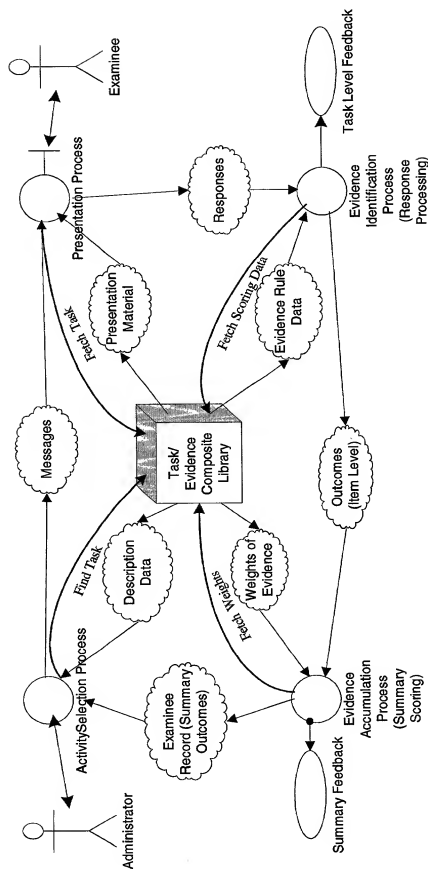
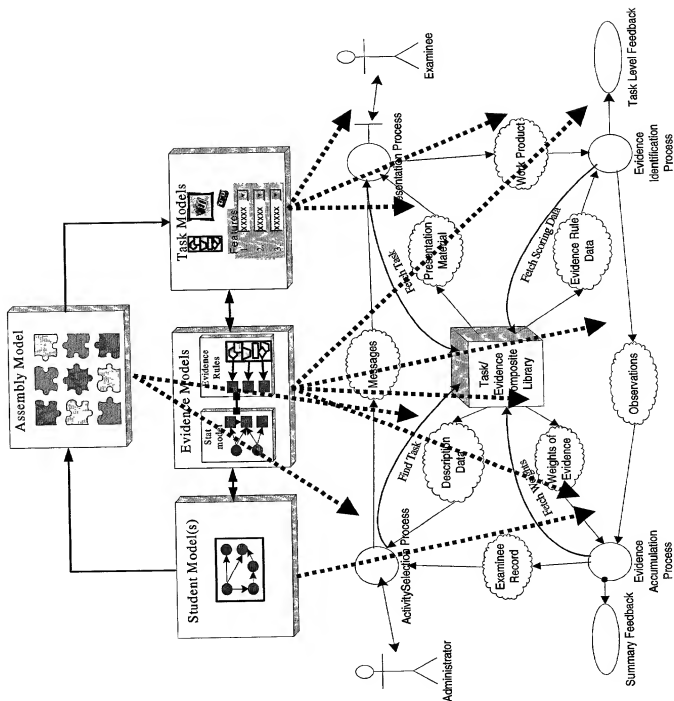
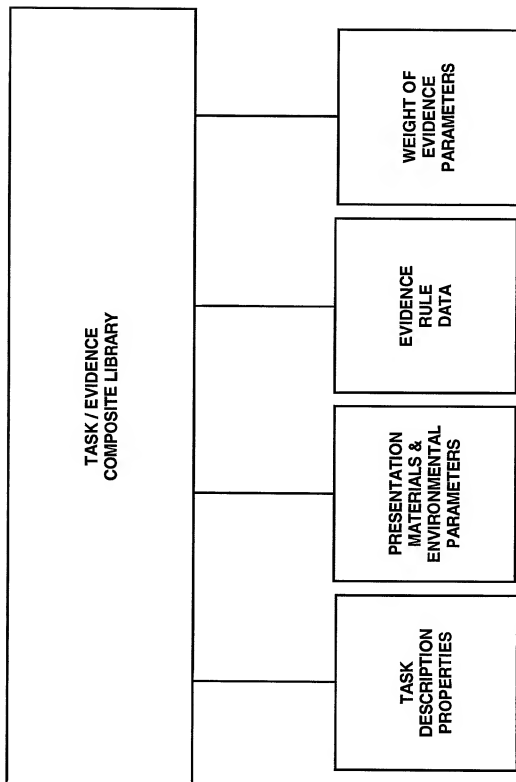


FIG 17

FIG 18





*FIG 19*

**Edit Student Model Variable**

Variable Name: **wKinQpy**

Description:  
 This potential student model variable represents the use of efficacious scientific methodology in formulating inquiries into transmission genetics and mechanisms of evolution.

States: **High** **Middle** **Low**

Properties: **State Details** **State Name:** **State Description:**

Pedigree: **State Name:** **State Description:**

Notes: **State Name:** **State Description:**

OK Save Cancel Help

**Edit Student Model Variable**

Variable Name: **DKMendel**

Description:  
 This potential student model variable represents factual (declarative) knowledge of the Mendelian Model (absent its integration w/inquiry or unifying concepts). Reporting: Inform + task-based feedback.

States: **High** **Middle** **Low**

Properties: **State Details** **State Name:** **State Description:**

Pedigree: **State Name:** **State Description:**

Notes: **State Name:** **State Description:**

OK Save Cancel Help

EXAMPLE STUDENT MODEL VARIABLES WITH STATES

FIG 20

**Reporting Rule**

Rule Name: **Reporting for WK and Transmission Genetics**

Rule Type: **unspecified**

Description:

**Specification**      **Pedigree**      **Notes**

**Instructions (human or computer):**

**Claims**

★ WK Claim 9

**Input Variables**

☐ DK  
☐ DKMendel  
☐ DKTrnGen  
☐ WKInqy  
☐ WKModRev  
☐ WKModUse

**Output**

Reporting Name: **Sample Statistic**

Interpretation:

**Score Ranges:**  
 Probabilities at particular levels of proficiency, accompanied by **Score Interpretation Guide**.

**Diagrams**

Add Remove Open  
 Add Remove Open

OK Save Cancel Help

AN EXAMPLE REPORTING RULE

FIG 21

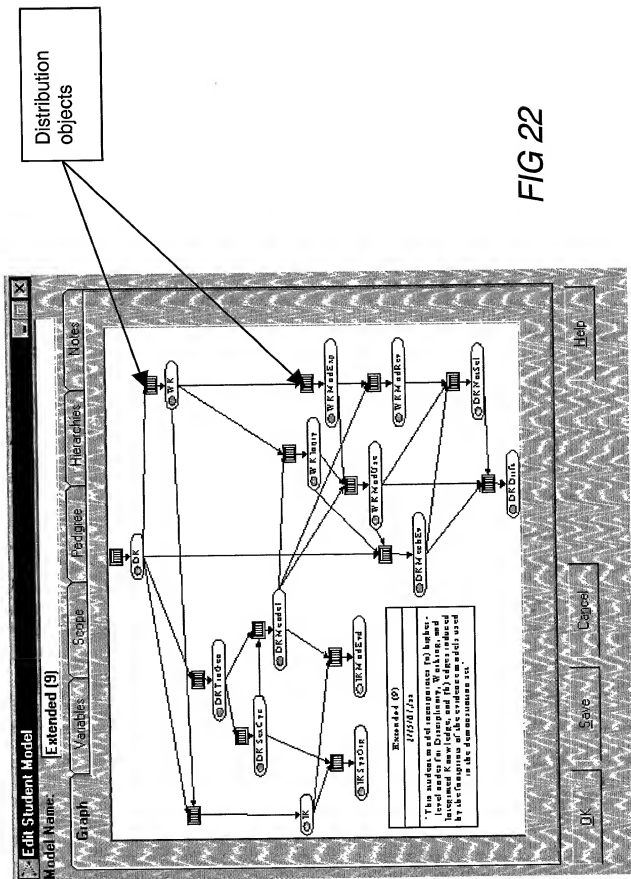


FIG 22



